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AGRICULTURAL RESEARCH SERVICE, U. S. DEPARTMENT OF AGRICULTURE

Dairy-Herd-Improvement Letter

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USDA TERMINATION CODES--WHAT ARE THEY? WHY ARE THEY USED?
HOW ARE THEY USED?

by G. J. King and B. T. McDaniel^{1/}

What are Termination Codes?

The 1967 DHI Computing Center Workshop adopted a set of termination codes to define the reasons for terminating cows' lactation records. The codes appear as the numbers zero through nine in lactation records. They take the place of the previously used codes for conditions affecting records (C.A.R. codes) as the basis for deciding whether or not to project a record to a 305-day basis when a cow was denied an opportunity to milk that long.

USDA suggests that the termination codes also be used to specify the reasons for cows leaving herds after completing 305-day lactations. An example is the selling of a cow immediately after she completes a 305-day lactation because she is not pregnant. Such a record would carry a "4" termination code even though it was 305 days long.

Use of the termination codes in this manner would give more complete data on the reasons for, and respective frequencies of, losses of different sires' daughters in succeeding lactations. It would also give better information on the frequencies and reasons for cow losses at different ages, for different herd sizes, and under different types of management practices. This information might help dairymen spot areas of their management or breeding that are contributing to short productive life of their cows.

The use in a 305-day record of a termination code which calls for a projection of the record is acceptable because the projection factor for a 305-day record is 1.00.

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^{1/} With technical assistance of C. A. Rampendahl and J. J. Corbin

The termination codes and their meanings are as follows:

<u>Termination code</u>	<u>Meaning</u>
0	Normal lactation terminated by dry date or 305 days in lactation when cow is still in the herd.
1	Incomplete terminated record of at least one valid test followed by two or more consecutive missed tests or a period of more than 75 days between consecutive tests, but the cow remains in the herd. The record up to the missed test to be coded "1" and sent to USDA--project to 305 days. <u>a/</u>
2	Sold for dairy purposes--project to 305 days.
3*	Sold because of low production--project to 305 days.
4*	Sold because of reproductive problems--project to 305 days.
5*	Sold because of disease, injury, or unspecified reason --project to 305 days.
6*	Died--project to 305 days.
7*	Sold because of mastitis or other udder problem--project to 305 days.
8	Record ended by an abortion--project to 305 days.
9	Record not to be used for sire or cow evaluation. <u>b/</u>

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*Centers unable to use codes 3 through 7 in the manner shown should code all these categories as code 3.

a/ The complete record of 305 days or less for a lactation that was terminated due to two consecutive missed tests or to having consecutive tests more than 75 days apart should be coded "9" and sent to USDA also. Some valid reasons for missed tests are (1) broken, spilled, or accidentally missed samples; (2) cow goes on show circuit during lactation.

b/ Lactation initiated by abortion; complete record with two or more consecutive months missing where valid portion of record has previously been submitted to USDA as code 1; a record for which any two consecutive tests were more than 75 days apart; no test within 78 days of calving. (The number of days is changed from 60 in accordance with the Official DHI Rules, Revised and Accepted by the Coordinating Group, July 1969.)

Why Use Termination Codes?

It is extremely important that the proper termination code accompany a cow's record so that it will be projected to a 305-day basis if the cow didn't have a chance to finish the record. Failure to project such a record (thus calling the record short, but complete) penalizes both the cow and sire. On the other hand, if improper coding causes a cow's record to be projected when it shouldn't be, the cow's index and her sire's Predicted Difference may be too high.

Proper use of the termination codes offers valuable information for evaluating sires on traits in addition to production. Codes 3, 4, 5, and 7 show the percentage of a bull's daughters that are culled. If this percentage is high, it may indicate that the sire is transmitting weaknesses in traits other than production that contribute to profitability. If there is a high percentage of code 3's (sold for low production), code 4's (sold for reproductive problems), or code 7's (sold because of mastitis or other udder problem), a dairyman should think twice before using heavily a bull that sired such daughters. For situations when daughters of a bull are in many herds, a high percent-incomplete-first-records in the USDA-DHIA Sire Summary List probably indicates heavy culling. Twelve percent incomplete first records is about average now.

How are Termination Codes Used?

Six of the 12 dairy records processing centers are now using the full set of termination codes shown on page 3 and accepted by the 1967 DHI Computing Center Workshop. The other six are using local C.A.R. and status codes for particular types of record terminations. This is acceptable (though not desirable) for sire evaluation because these centers have informed Dairy Herd Improvement Investigations (DHII) which of these codes indicate records to be projected. However, the additional information on the reasons for culling cows is not available unless the full set is used.

Tables I-1 through I-6 appear on pages 8 through 13 and give numbers and percentages of the termination codes

grouped according to stage of lactation when the record was terminated, i.e., 1 to 14 days, 15 to 89 days, 90 to 179 days, 180 to 239 days, 240 to 279 days, 280 to 304 days, and 305 days only.

Tables I-1 and I-2 summarize the termination codes reported on all lactation records received by USDA for entry in 1968 and 1969 sire summary runs. Data in 1968 indicate that of the total of 1,975,276 lactation records reported, 1,778 were less than 15 days long and thus not used. Similarly, 2,317 of 2,106,631 records were less than 15 days long in 1969. These are classified according to termination code, and it is interesting to note that in 1968, 196 records of less than 15 days were coded as being complete. In 1969, 215 were coded as complete records, and two were coded as being ended by abortion. The appearance of the abortion code after only 15 days in milk probably indicates miscoding.

Table I-2 shows that 419,475 records were used in 1969 by projecting to a 305-day basis. Of this number, 356,494 were made by cows which were then lost to dairying. This was 16.9 percent of the lactations reported. The 16.9 percent is composed of all lactations having codes 3, 4, 5, 6, and 7. In addition, other cows are lost for which USDA does not receive a record, such as those which die at calving or are slaughtered after going dry. These would probably raise the proportion of cows lost to dairying each year to approximately 20 percent. This turnover of nearly one-fifth of the Nation's dairy herd each year has remained fairly constant for several years. Reduction of this loss of productivity is a research goal of the Animal Science Research Division.

Tables I-3 and I-4 show the percentages for each termination code-period-of-lactation group for 1968 and 1969. In 1968, 48.1 percent of the records sent to USDA were 305 days long compared with 48.4 percent in 1969. At the other extreme, records under 15 days made up about 0.1 percent of the records in both years. These were not used in sire evaluation. In 1968, 32.2 percent of the records sent to USDA were short, complete records of less than 305 days; in 1969, the comparable value was 31.6 percent. Thus, it was necessary to project to a 305-day basis about 20 percent of the records submitted in each year.

In 1968, 3.7 percent of the records used for sire evaluation were less than 90 days in length. The figure for 1969 was 3.9 percent. The number of records for 90 to 179 days in 1968 was 6.5 percent of the total and 6.8 percent in 1969.

The figures for records projected increased in most categories in 1969 over 1968. Only at 240 to 279 days and at 280 to 304 days did percentages decrease.

Tables I-5 and I-6 give the percentages of records in days-in-milk groups within termination codes for 1968 and 1969, respectively.

Improper Use of Termination Codes.

There is apparently some misunderstanding of the use of termination codes as they are entered into the records --a subject for an educational program in the States.

A few records (45) in the two years that were less than either 152 days or 200 days in length (90 to 179 days) were coded as terminated by abortion. Official DHI Rule 11 states that "if a cow aborts while in milk and has carried a calf less than 152 days" or "if a breeding date is not available and the cow aborts while in milk for less than 200 days, her current record will continue without interruption." If these records are otherwise normal, and are terminated by a dry date or 305 days in lactation, the termination code "0" should be used.

Proper Use of Termination Codes.

The reporting of some codes, however, is apparently more precise, because their use for a purpose and cow disposal history coincide. For instance code 4 appears most frequently in lactations of 180 to 279 days--the stage when non-pregnant cows are often sold. Code 7 appears more frequently in short lactations, which is consistent with practice because cows affected by mastitis early in lactation

are more likely to be sold than those affected at later stages.

Summary

USDA uses termination codes to find that almost one-third of the records used for sire summaries are complete records of less than 305 days, and to project another one-fifth of the records to a 305-day basis. Therefore, much research is still needed on the effect of short records on sire summaries and on the accuracy of projection factors.

II. LACTATION RECORDS RECEIVED BY USDA IN 1969^{2/}

In 1969, 1,870,276 Official DHI lactation records were reported to USDA for use in statistical summaries, genetic appraisals, and research. This is 46,555 less than were reported in 1968. The numbers of records reported by State in 1969 are given in table II-1.

A 13-year summary of the records reported since 1957 is shown in table II-2.

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^{2/} Tables prepared by C. A. Rampendahl from data received in the DHII office.

TABLE I-1.--Termination code distribution within days-in-milk groups for the runs of January, May, and September 1968

Termination code	Days in milk							Total records
	1-14	15-89	90-179	180-239	240-279	280-304	305 only	
	----- Number of records -----							
0	196	4,643	10,673	40,610	219,806	360,830	933,678	1,570,436
1	---	-----	4	4	15	15	117	155
2	504	21,159	23,979	16,350	10,295	5,593	1,990	79,870
3	952	41,274	86,566	76,959	48,837	24,469	10,644	289,701
4	1	229	1,616	3,336	3,173	1,923	1,269	11,547
5	26	1,413	1,564	933	552	256	189	4,933
6	68	1,435	1,094	527	297	180	44	3,645
7	31	2,179	3,385	2,200	1,185	561	312	9,853
8	---	7	26	815	1,809	1,385	1,094	5,136
9	---	-----	-----	-----	-----	-----	-----	-----
Overall	1,778	72,339	128,907	141,734	285,969	395,212	949,337	1,975,276
Total records projected	-----	67,696	118,234	101,124	66,163	34,382	-----	387,599

TABLE I-2.--Termination code distribution within days-in-milk groups for the runs of January, May, and September 1969

Termination code	Days in milk							Total records
	1-14	15-89	90-179	180-239	240-279	280-304	305 only	
	<u>Number of records</u>							
0	215	6,974	14,633	43,365	218,601	381,322	1,003,564	1,668,674
1	5	51	48	52	63	121	409	749
2	602	21,863	22,974	14,879	9,032	4,974	1,529	75,853
3	1,096	44,548	92,354	82,379	51,422	25,501	11,933	309,233
4	18	531	2,724	4,859	4,442	2,773	784	16,131
5	120	2,836	3,892	2,704	1,592	803	456	12,403
6	179	2,170	1,620	850	443	292	79	5,633
7	80	3,032	4,538	2,802	1,623	773	246	13,094
8	2	16	19	721	1,795	1,364	944	4,861
9								
Overall	2,317	82,021	142,802	152,611	289,013	417,923	1,019,944	2,106,631
Total records rejected								

TABLE I-3.--Percentages of termination code distribution within days-in-milk groups for the runs of January, May, and September 1968

Termination code	Days in milk							Overall within termination code
	1-14	15-89	90-179	180-239	240-279	280-304	305 only	
	----- Percent -----							-----
0	0.01	0.24	0.54	2.06	11.13	18.26	47.26	79.50
1	-----	-----	(<u>1</u> /)	(<u>1</u> /)	(<u>1</u> /)	(<u>1</u> /)	.01	.01
2	.03	1.07	1.21	.83	.52	.28	.10	4.04
3	.05	2.09	4.38	3.90	2.47	1.24	.54	14.67
4	(<u>1</u> /)	.01	.08	.17	.16	.10	.06	.58
5	(<u>1</u> /)	.07	.08	.05	.03	.01	.01	.25
6	(<u>1</u> /)	.07	.06	.02	.02	.01	(<u>1</u> /)	.18
7	(<u>1</u> /)	.11	.17	.11	.06	.03	.02	.50
8	-----	(<u>1</u> /)	(<u>1</u> /)	.04	.09	.07	.06	.26
9	-----	-----	-----	-----	-----	-----	-----	-----
Overall	.09	3.66	6.52	7.18	14.48	20.00	48.06	99.99
Percentage of records projected	-----	3.42	5.98	5.12	3.35	1.74	-----	19.61

1/ Less than 0.01 percent.

TABLE I-4.--Percentages of termination code distribution within days-in-milk groups for the runs of January, May, and September 1969

Termination code	Days in milk							Overall within termination code
	1-14	15-89	90-179	180-239	240-279	280-304	305 only	
	<u>Percent</u>							
0	0.01	0.33	0.69	2.06	10.38	18.10	47.64	79.21
1	(1/)	(1/)	(1/)	(1/)	(1/)	.01	.02	.03
2	.03	1.04	1.09	.71	.43	.24	.07	3.61
3	.05	2.11	4.38	3.91	2.44	1.21	.57	14.67
4	(1/)	.03	.13	.23	.21	.13	.04	.77
5	.01	.13	.18	.13	.08	.04	.02	.59
6	.01	.10	.08	.04	.02	.01	(1/)	.26
7	(1/)	.14	.22	.13	.08	.04	.01	.62
8	(1/)	(1/)	(1/)	.03	.09	.06	.04	.22
9	----	----	----	----	----	----	----	----
Overall	.11	3.88	6.77	7.24	13.73	19.84	48.41	99.98
Percentage of records projected	----	3.55	6.08	5.18	3.35	1.74	-----	19.90

1/ Less than 0.01 percent.

TABLE I-5.--Percentage of records in days-in-milk groups within termination codes
for the runs of January, May, and September 1968

Termination code	Days in milk					
	1-14	15-89	90-179	180-239	240-279	280-304 305 only
				<u>Percent</u>		
0	0.01	0.30	0.68	2.59	14.00	22.98 59.45
1	-----	-----	2.58	2.58	9.68	9.68 75.48
2	.63	26.49	30.02	20.47	12.89	7.00 2.49
3	.33	14.25	29.88	26.56	16.86	8.45 3.67
4	.01	1.98	13.99	28.89	27.48	16.65 10.99
5	.53	28.64	31.70	18.91	11.19	5.19 3.83
6	1.87	39.37	30.01	14.46	8.15	4.94 1.21
7	.31	22.12	34.36	22.33	12.03	5.69 3.17
8	-----	.14	.51	15.87	35.22	26.97 21.30
9	-----	-----	-----	-----	-----	-----

TABLE I-6.---Percentage of records in days-in-milk groups within termination codes for the runs of January, May, and September 1969

Termination code	Days in milk						
	1-14	15-89	90-179	180-239	240-279	280-304	305 only
	<u>Percent</u>						
0	0.01	0.42	0.88	2.60	13.10	22.85	60.14
1	.67	6.81	6.41	6.94	8.41	16.15	54.61
2	.79	28.82	30.29	19.62	11.91	6.56	2.02
3	.35	14.41	29.87	26.64	16.63	8.25	3.86
4	.11	3.29	16.89	30.12	27.54	17.19	4.86
5	.97	22.87	31.38	21.80	12.84	6.47	3.68
6	3.18	28.52	28.76	15.09	7.86	5.18	1.40
7	.61	23.16	34.66	21.40	12.39	5.90	1.88
8	.04	.33	.39	14.83	36.93	28.06	19.42
9	----	-----	-----	-----	-----	-----	-----

TABLE II-1.--Lactation records received in 1969 ^{1/}

State	Official DHI cows on test 1-1-69	1969 production records		1968 production records	
		Total	Proportion of cows enrolled in Official DHI	Total	Proportion of cows enrolled in Official DHI
	Number	Number	Percent ^{2/}	Number	Percent ^{2/}
Alabama-----	32,277	33,630	104.2	25,733	80.2
Alaska-----	232	193	83.2	170	86.7
Arizona-----	20,574	7,801	37.9	6,764	47.3
Arkansas-----	5,098	4,616	90.5	4,080	93.3
California-----	363,627	113,122	31.1	65,131	17.5
Colorado-----	18,496	14,106	76.3	8,713	45.2
Connecticut-----	23,560	23,708	100.6	32,122	141.7
Delaware-----	4,661	5,058	108.5	6,145	145.1
Florida-----	20,584	21,745	105.6	16,855	80.0
Georgia-----	31,507	32,409	102.9	27,149	87.2
Hawaii-----	3,032	2,531	83.5	3,941	91.2
Idaho-----	25,785	28,243	109.5	24,715	109.9
Illinois-----	57,483	85,234	148.3	71,040	122.4
Indiana-----	39,409	39,493	100.2	42,056	96.1
Iowa-----	62,113	61,030	98.3	58,356	96.0
Kansas-----	39,640	39,456	99.5	37,493	98.2
Kentucky-----	23,733	25,086	105.7	19,431	82.7
Louisiana-----	10,549	9,877	93.6	6,534	78.2
Maine-----	17,905	19,344	108.0	26,670	142.0
Maryland-----	41,040	34,400	83.8	38,362	92.0
Massachusetts-----	20,032	20,261	101.1	28,114	140.4
Michigan-----	79,632	72,691	91.3	66,919	85.7
Minnesota-----	123,790	3/112,325	90.7	120,901	101.6
Mississippi-----	22,907	23,592	103.0	17,710	80.9
Missouri-----	29,323	28,155	96.0	25,508	97.3
Montana-----	5,090	2,137	42.0	2,005	46.5
Nebraska-----	19,338	18,755	97.0	17,943	95.5
Nevada-----	4,748	1,938	40.8	1,735	27.2
New Hampshire-----	10,313	12,014	116.5	18,336	140.9
New Jersey-----	22,488	24,183	107.5	34,273	142.9
New Mexico-----	6,790	8,789	129.4	6,343	91.7
New York-----	188,007	198,395	105.5	276,640	148.3
North Carolina---	50,377	55,220	109.6	43,790	87.8
North Dakota----	6,271	6,111	97.4	5,033	85.3
Ohio-----	88,729	85,456	96.3	88,835	97.6
Oklahoma-----	19,188	18,094	94.3	16,786	98.7
Oregon-----	26,600	28,247	106.2	25,731	106.3
Pennsylvania-----	157,838	144,516	91.6	203,108	114.0
Puerto Rico-----	1,007	-----	-----	-----	-----
Rhode Island-----	1,908	1,884	98.7	2,928	131.3
South Carolina---	29,261	29,379	100.4	22,201	84.1
South Dakota-----	6,914	6,913	100.0	5,985	106.8
Tennessee-----	30,840	32,790	106.3	26,353	85.0
Texas-----	33,402	32,433	97.1	27,456	84.5
Utah-----	22,318	18,883	84.6	19,002	90.0
Vermont-----	38,335	40,676	106.1	58,010	148.3
Virginia-----	63,789	67,979	106.6	55,807	88.6
Washington-----	42,714	53,106	124.3	44,209	118.7
West Virginia----	9,661	9,843	101.9	12,241	146.3
Wisconsin-----	134,594	114,203	84.8	121,248	92.4
Wyoming-----	1,443	226	15.7	221	14.1
United States----	2,138,953	1,870,276	87.4	1,916,831	89.9

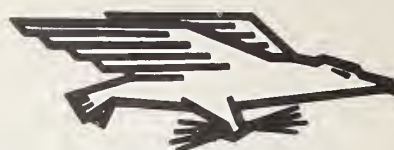
^{1/} Lactation record input for May and September 1969, and January 1970 production runs.^{2/} Percentages vary by State and may exceed 100 percent depending upon reporting and processing procedures in December and January of each year and year-to-year changes in reporting procedures.^{3/} Does not include approximately 18,000 lactation records that were resubmitted from Minnesota computing center.

TABLE II-2.--Thirteen-year summary of lactation records received by USDA

Year	Official DHI cows enrolled on January 1 of each year	Lactation records reported to USDA	Official DHI cows represented by re- cords reported
	<u>Number</u>	<u>Number</u>	<u>Percent</u>
1957-----	1,479,799	565,360	38
1958-----	1,548,884	786,496	51
1959-----	1,607,538	927,998	58
1960-----	1,746,752	886,495	51
1961-----	1,867,469	1,084,799	58
1962-----	1,958,355	1,211,407	62
1963-----	2,006,534	1,320,423	66
1964-----	2,010,144	1,437,959	72
1965-----	2,087,581	1,749,752	84
1966-----	2,058,592	1,788,974	87
1967-----	2,098,919	1,851,274	88
1968-----	2,131,929	1,916,831	90
1969-----	2,138,953	1,870,276	87

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